



Department of Engineering
Seminar Program
Wednesday, February 19, 2014
Shanahan Teaching and Learning Center
Lecture Hall 1430, 4:15pm

**“Graphene: History, Synthesis, and Nanotechnology”
Albert Dato, Ph.D.**

Summary:

Graphene is a single atomic layer of carbon atoms that possesses extraordinary electronic, mechanical, thermal, and optical properties. The significance of graphene is underscored by the 2010 Nobel Prize in Physics, which was awarded to the researchers who first isolated and characterized the remarkable nanomaterial in 2004. Graphene has a diverse range of potential nanotechnology applications, such as flexible electronics, nanocomposites, energy storage, solar cells, nanomedicine, biosensing, photonics, and catalysis. Thus, graphene continues to generate intense scientific interest and a wealth of funding, such as the 1 billion euro awarded to graphene research by the European Commission in January 2013.

The first part of this seminar will discuss the exciting history of graphene, including the start of the “graphene gold rush” in 2004 and research into the material’s unique properties. The second part will examine Dr. Dato’s contributions to the field of graphene research, which include the discovery of gas-phase graphene synthesis and the first use of graphene to image the surface molecules on nanoparticles. The third part of this presentation will summarize recent developments in graphene research, such as new synthesis methods and game-changing nanotechnology. The final part of this seminar will focus on Dr. Dato’s future work, which is aimed at overcoming the greatest challenge to the realization of graphene applications. Dr. Dato will present immediate research goals that could be achieved through design and hands-on experiential learning opportunities.

Bio:

Dr. Albert Dato received B.S. degrees in Mechanical and Aeronautical Engineering from UC Davis, and an M.S. degree in Mechanical Engineering from UC Berkeley. He completed his Ph.D. in Applied Science & Technology at UC Berkeley, with a designated emphasis in Nanoscale Science and Engineering. While conducting his doctoral research, he discovered a novel method of rapidly synthesizing graphene, which is a single layer of carbon atoms that exhibits amazing properties. He also developed a graphene application that enabled the imaging of the surface molecules on gold nanoparticles for the first time. His peer-reviewed publications have received hundreds of citations and his work was featured as the cover image of the March 2010 issue of the journal Nano Letters. After earning his Ph.D., he founded the startup Graphene LLC, which was one of the first companies to bring high-quality graphene to market and continues to supply the nanomaterial for research and applications. In addition to conducting graphene research, he has worked in the semiconductor industry as a process development engineer for Novellus Systems, Inc. and he is currently a scientist at Air Liquide Electronics U.S. He has taught courses in materials science, thermodynamics, and engineering at UC Berkeley, and has worked in K-12 STEM outreach programs aimed at increasing diversity in higher education. He is a recipient of the UC Berkeley Outstanding Graduate Student Instructor Award and a National Science Foundation GK-12 Fellowship.